

Exhibit 38

SCHOOL DISTRICT/LOCAL GOVERNMENT ENTITY PLAINTIFFS' OPPOSITION TO DEFENDANTS' MOTION TO EXCLUDE TESTIMONY OF SCHOOL DISTRICT EXPERTS

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

Expert Report of Dr. Bryce Ward

Tucson Unified School District



Highly Confidential - Subject to Protective Order

May 19, 2025

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I. SUMMARY

A. Executive Summary of Opinions

1. Based on my analysis and review of materials related to this case, I proffer the following opinions at this time to a reasonable degree of economic certainty. Should new information become available I may revise my analysis, my opinions, or both:

- a. Opinion 1: Tucson Unified School District has incurred past compensatory damages, in the form of lost opportunity costs, from 2016-2017 through 2023-2024 for teachers in the amount of \$26.3M in wages and \$34.2M in wages and benefits (\$2025, valued at the mean reported loss) for time diverted and efforts expended due to student social media use.
- b. Opinion 2: Tucson Unified School District has incurred past compensatory damages, in the form of lost opportunity costs, from 2016-2017 through 2023-2024 for non-teaching staff, in the amount of \$51.1M in wages and \$66.4M in wages and benefits (\$2025) for time diverted and efforts expended due to student social media use.
- c. Opinion 3: Tucson Unified School District has incurred past compensatory damages, in the form of lost opportunity costs, from 2016-2017 through 2023-2024 teachers and non-teaching staff for a combined total of between \$77.4M in wages and \$100.6M in wages and benefits (\$2025) for time diverted and efforts expended due to student social media use. A wider range is obtained if one assumes losses at the ends of the confidence interval.

B. Qualifications

2. I am a founder of ABMJ Consulting (ABMJ), which provides economic and statistical analysis for complex litigation. I have also served as a Senior Research Professor, Visiting Assistant Professor or a Visiting Adjunct Professor at the University of Montana, Lewis and Clark College, the University of Oregon, and Portland State University, where I taught courses in microeconomic theory, statistics and econometrics, public economics, labor economics, and environmental economics. I have testified on economic matters in administrative, legislative, and court proceedings, and I have presented papers at professional proceedings on economics. I received a Ph.D. in economics from Harvard University. Attached as Exhibit A is my *curriculum vitae* and table of testimony over the past four years.

3. My work specific to this report and any subsequent testimony is compensated at \$665 per hour. My compensation is not dependent on the outcome of this matter.

C. Information Considered

4. I base my opinions described in this report on my past experience and education as well as on the materials specific to this matter that I reviewed and considered. These materials are detailed in the report text, and are also identified in Appendix B.

II. BACKGROUND AND ASSIGNMENT

5. As I understand it, the plaintiffs seek to recover damages sufficient to reimburse them for past harm (compensatory damages), and to defray future costs caused by social media. This report focuses on the first category of harm (past compensatory damages). Specifically, I calculate the amount of money districts expended while teachers, counselors, and/or administrators addressed issues caused by social media in the school environment. As I understand it, a separate expert is charged with calculating future costs, and another expert is charged with calculating other damages incurred to fund mental health programs, social emotional learning programs, and/or technology costs caused by social media.

6. With respect to past damages relating to the diversion of time spent by teachers, counselors, and/or administrators, the plaintiffs claim that they should be reimbursed for time diverted and efforts expended due to the student social media use.¹ In particular, the plaintiffs claim that school staff shifted their time and attention from other matters to deal with the disruptive forces of the defendants' social media platforms and the effects caused in schools, and thus, the plaintiffs claim they should be reimbursed for the cost of the time diverted.

7. The plaintiffs' approach to damages is based on the fundamental economic concept of opportunity cost. When a person allocates a scarce resource—such as money, time, or effort—to a particular use, they forgo the opportunity to use that resource for another potentially

¹ Order Granting in Part and Denying in Part Defendants' Motion to Dismiss the School District and Local Government Entities' Master Complaint (Oct. 24, 2024), ECF No. 1267 at 19-20 ("The school districts allege injuries that include, but are not limited to, diverting and increasing financial resources to address the disruptive forces of defendants' social media products in school; hiring mental health personnel and developing mental health resources; implementing new information technology and physical resources to limit access to and mitigate risks caused by defendants' platforms; and repairing property damage. These injuries borne by the school districts are related to, but unique from, the alleged injuries of their minor students."); 20-21 ("The social media defendants are alleged to have deliberately fostered compulsive use in minor users, which would foreseeably cause the kind of damage mitigation expenditure incurred by the school districts."); 26 ("[P]laintiffs' core theory of injury suffices to establish proximate cause at the pleading stage: as alleged, defendants' conduct deliberately fostered compulsive use of their platforms which foreseeably caused the plaintiff school districts to respond by expending resources to mitigate the impact of such use in their schools"); 44 ("In sum, defendants' conduct is plausibly alleged to have contributed to negative mental health outcomes for students, causing foreseeable resource expenditures by the school districts to combat that alleged public health crisis"); Order Granting in Part and Denying in Part Defendants' Motion to Dismiss the School District and Local Government Entities' Claims of Public Nuisance (Nov. 15, 2024), ECF No. 1332, at 22-23 ("[D]efendants fail to rebut (i) that the public health is a right common to the public, (ii) and that their conduct as alleged interferes with that common right. While the students' injuries are individualized byproducts of that interference, and while the school districts' resource diversion and expenditure are individualized corollary impacts of those individual students' harms, those harms and costs all flow from defendants' alleged interference with the public health."); 26-27 ("Here, defendants' conduct as alleged has a tendency to affect all youth and the general public, even if the school districts seek remedy solely for consequences that occur to schools, on school grounds, and during school hours").

beneficial purpose. In economic terms, opportunity cost refers to the value of the forgone alternative.

8. A simple example helps to illustrate this concept. Imagine someone dumps garbage on my lawn every week. I dislike having garbage on my lawn, so I spend one hour each week cleaning it up. Since time is limited, I could have spent that hour doing something else. In effect, something I otherwise would have done does not get done. The value of that foregone activity is the opportunity cost of choosing to clean up the garbage. Thus, the primary harm from the trash on my lawn stems from the time I spend removing it, time I could have spent elsewhere.²

9. Economists often estimate the opportunity cost of time using the individual's wage. The opportunity cost of an hour spent cleaning my lawn is frequently assumed to equal my hourly wage. While the precise value of the opportunity cost of time is often context dependent, the wage is the common starting point, particularly when work time is at the relevant margin (i.e., the alternative to cleaning up my yard was working for an additional hour).

10. The plaintiffs' damage claims follow this same logic. First, relevant staff time during the school day—such as that of teachers—is finite (e.g., teachers are employed to work a fixed number of hours during the school day per year). Due to the defendants' alleged unlawful conduct, some portion of that time is redirected away from other tasks, creating opportunity costs.

11. Second, the value of this lost time can be measured using employee compensation (i.e., wages) because that is the dollar amount the school districts pay their staff for work during school hours. In other words, the district should be entitled to recover the cost of the time spent responding to the harms caused by the defendants' actions. School districts do not pay different rates for different tasks during the contractually specified work day—a teacher receives the same wage regardless of the specific duties performed. Therefore, valuing the time diverted to social media using the employee's regular salary or compensation rate is reasonable. It is a common practice to use wage rates when valuing lost or diverted time in various economic/education policy and litigation contexts.³

12. My analysis of past damages for diversion thus equals the amount of time diverted times the cost of that time (e.g., wages or compensation per hour). Alternatively, one could view damages as the share of time diverted times the total compensation. Mathematically,

² There are other potential harms as well, such as sanitary concerns or the disutility of seeing garbage on the lawn while it remains there, or costs associated with cleanup—e.g., garbage bags, gloves.

³ For instance, cost-effectiveness evaluations of education programs often value teacher time using market prices (i.e., wages and benefits). Similarly, when performing a cost analysis for an educational program the Department of Education suggests valuing teachers' opportunity costs using their wages. Levin, H. M., & Belfield, C. (2015). Guiding the development and use of cost-effectiveness analysis in education. *Journal of research on educational effectiveness*, 8(3), 400-418; Levin, H. M., & McEwan, P. (2001). *Cost-effectiveness analysis: Methods and applications*. Monterey Park, CA: Sage. Hollands, F., Pratt-Williams, J., & Shand, R. (2020). *COST ANALYSIS STANDARDS & GUIDELINES 1.0*. In the litigation context, using wages to value economic damages (which are fundamentally linked to opportunity costs) is common practice in personal injury matters or business damages (particularly when evaluating diverted or lost employee time due to some alleged wrongful act).

these approaches are equivalent; however, people may find one more intuitive, so I reference both here.

13. My primary assignment for this report is to calculate the compensation or cost of time for the relevant staff in the district. My assignment also includes multiplying these amounts by the estimated diverted time to produce the estimate for past losses. However, my assignment does not include calculating the time diverted due to the alleged unlawful acts. I relied on a survey of teachers and/or witness declarations for those amounts.

III. TIME COSTS: WAGES AND BENEFITS PAID TO DISTRICT STAFF

14. Calculating time costs is conceptually straightforward. Identify the populations covered by the available survey or affidavit-based evidence. Then, sum all amounts paid for work included in the survey or affidavit-based time loss evidence (including benefits costs).

15. First, I identified the people who comprise the population sub-groups included in the survey data or affidavits that I received.

16. The data provided to me by the Tucson Unified School District describe base pay amounts for each employee.⁴ These data also include several variables that define each employee's position in the district with varying degrees of detail.⁵ The data also describe each individual's worksite location.⁶

17. My assignment was to use these data to identify middle and high school teachers or other staff positions with estimates for time loss in affidavits to allow me to compute the wages (and benefits) paid during any reported lost time. The specific positions described in the affidavits of Brian Lambert, Holly Hammel, Sabrina Salmon, and Julie Shivanonda include:

- Bachelor's Level Social Worker
- Behavioral Intervention Monitors
- Behavioral Specialists
- Counseling Interns
- Counselors
- Elementary Site Administrators
(principals and assistant principals)
- Exceptional Education Intervention Specialists
- Exceptional Education Behavioral Intervention Specialists
- High School Site Administrators
(principals and assistant principals)
- Licensed Clinical Social Workers

⁴ The data examined include Tucson – FY17 Social Media Litigation_Positions_04.27.25_TUSD.xlsx-Tucson – FY24 Social Media Litigation_Positions_04.27.25_TUSD.xlsx".

⁵ These variables include POSITIONTYPE2, PostitionType1, Description, and StateCodeDescription.

⁶ These variables include DAC, PrimaryWorksite, and PayLocation.

- Middle School Site Administrators (principals and assistant principals)
- MTSS Coordinators and Facilitators
- Master’s Level Social Worker
- Other Psychologists
- Other Social workers
- Psychology Externs
- Psychology Interns
- Restorative Practice Facilitators
- SEL Director
- SEL Program Coordinators
- School Counseling Interns
- School Psychologist
- Specialist Counselors.⁷

18. Identifying these positions is straightforward. Records corresponding to teachers are identifiable in the data. I include anyone whose POSITIONTYPE2 is “Teacher;” however, among this set of individuals, I exclude individuals whose PositionType1 indicates holding a position covered under the district’s “Other Certificated, Non-Teaching Pay Schedule (these include Teacher – Master Teacher and Mentor – Teacher).⁸

19. The positions covered by the affidavits are also identified in the data. Nearly all of them are identical (or slight variations on) the categories listed in the Description variable.

20. Given that the survey applies to middle and high school teachers and some positions covered by affidavits also specify different school levels (e.g., elementary, middle, and high school), I used the DAC variable⁹ to allocate positions to school levels. I identified the grade span for each school listed in the data using the school district’s website.¹⁰ For schools including the traditional grade levels (e.g., K-5 for elementary, 6-8 for middle, and 9-12 for high), I assign all positions associated with that school to that level.¹¹ For sites that span different levels (e.g., K-8), I assume that positions are distributed proportionately to the grades covered (e.g., 1/3 of positions are middle school positions and 2/3 are elementary).¹²

⁷ Lambert Decl. ¶¶ 5, 16-19; Shivanonda Decl. ¶¶ 4, 16-19; Hammel Decl. ¶¶ 13, 16-18; Salmon Decl. ¶¶ 6-7, 15-18.

⁸ I also exclude teaching assistants. The list of professional non-teaching positions is available in the file “Professional Non-Teaching Salary 24-25.pdf.”

⁹ The DAC variable identifies the location where the employee works, such as specific schools and or district office.

¹⁰ <https://www.tusd1.org/schools> (accessed May 7, 2025).

¹¹ I also assign all positions to the school level for grade offering that are wholly subsumed by the standard levels (e.g., K-3).

¹² Since the data do not allow for precise identification of the positions at each level, I assign each position a weight for each potential level and then compute weighted sums for the totals by position-level. This assumption is appropriate as long as student-teacher (or student-staff) ratios are similar across grade levels, which is generally true.

21. Table 1 shows the total base pay amounts for the listed categories of staff in 2023-2024 (\$2025).¹³ Certain positions are also eligible for additional supplemental pay under their contract (\$8,600 in 2023-24).¹⁴ I add these amounts in the second and fourth columns. Finally, Tucson pays benefits equal to 30 percent of the base pay amount. I add these amounts in the third and fourth columns.¹⁵

Table 1: Total Base Pay, Plus Supplement, Plus Benefits for Selected Positions in Tucson, 2023-24 (\$2025)

	Real Base	Real Base + Supplement	Real Base + Benefits	Real Base + Supplement + Benefits
Teacher, Elem	42,464,796	49,841,116	55,204,236	49,841,116
Teacher, High	29,008,212	35,025,980	37,710,676	35,025,980
Teacher, Middle	19,333,812	22,866,380	25,133,956	22,866,380
Teacher, Rest of dist	7,538,856	8,810,548	9,800,513	8,810,548
Principal, Elem	4,943,385	4,943,385	6,426,401	4,943,385
Principal, High	1,292,357	1,292,357	1,680,064	1,292,357
Principal, Middle	1,709,415	1,709,415	2,222,240	1,709,415
Asst. Principal, Elem	787,920	787,920	1,024,296	787,920
Asst. Principal, High	1,846,285	1,846,285	2,400,171	1,846,285
Asst. Principal, Middle	1,046,111	1,046,111	1,359,945	1,046,111
Counselor, Elem	1,931,190	1,931,190	2,510,547	1,931,190
School Counseling Intern, Elem	84,065	84,065	109,284	84,065
Behavior Intervention Monitor, Elem	136,374	136,374	177,286	136,374
Restorative Practice Facilitator, Elem	30,642	30,642	39,834	30,642
Social Worker - Master's, Elem	151,961	151,961	197,549	151,961
Behavior Specialist, Elem	77,499	77,499	100,749	77,499
School Counseling Intern, High	71,658	71,658	93,156	71,658
Behavior Intervention Monitor, High	58,545	58,545	76,109	58,545
Social Worker - LCSW, High	84,846	84,846	110,300	84,846
Social Worker - Master's, High	203,477	203,477	264,520	203,477
Behavior Specialist, High	32,084	32,084	41,709	32,084

For instance, according to data from the National Center for Education Statistics's Elementary/Secondary Information System, the student-teacher ratio in Tucson is nearly identical for PK-5 schools, PK-8 schools, and 6-8 schools (15.3-15.4).

¹³ I use "\$2025" to signify that dollar amounts are adjusted for inflation to 2025 using the Personal Consumption Expenditures Price Index.

¹⁴ All teachers within the category of the TDR-A salary schedule in the Consensus Agreement with certified employees are eligible to receive the supplemental base pay amount.

¹⁵ Tucson - FY2024 Social Media Litigation_Positions_04.27.25_TUSD. I note for consistency with my other reports that calculating this amount by dividing total benefits spending by total wages/salaries using budget data yields a slightly higher percentage (31 percent in FY2023 and FY24 and 32 percent in FY2022). I use the more conservative number provided by the district in this report. [Data from annual-financial-report-FY22-20221006.pdf, FY23-budget-adopted.pdf, and 2023-07-11 2024EXPBUD_Adopted_signed(1).pdf.]

Counselor, High	1,306,802	1,306,802	1,698,843	1,306,802
School Counseling Intern, Middle	84,946	84,946	110,430	84,946
Restorative Practice Facilitator, Middle	15,092	15,092	19,620	15,092
Social Worker - Master's, Middle	98,236	98,236	127,707	98,236
Behavior Specialist, Middle	24,412	24,412	31,736	24,412
Counselor, Middle	763,499	763,499	992,549	763,499
Behavior Intervention Monitor, Middle	14,751	14,751	19,176	14,751
Program Coordinator - MTSS, Rest of district	66,197	66,197	86,056	66,197

IV. TIME LOST

22. The second question for determining past compensatory damages, in the form of lost opportunity costs, is, “How much or what share of the staff time was ‘lost’ due to student social media use?”

23. Existing studies confirm that, across the nation, public school teachers are losing time to dealing with disruptions from social media in their classrooms.

24. For instance, in one recent report, 88 percent of middle school teachers and 90 percent of high school teachers reported they viewed student social media use as a serious problem, and 58 percent of middle school teachers and 82 percent of high school teachers reported that it was a serious problem in class.¹⁶ Furthermore, among those who reported that social media was a serious problem, 33 percent reported that disruption of instructional time was one of their top three concerns about student social media use. Additionally, 19 percent included the time it took to regulate it as a top three concern.

25. A separate survey found that 72 percent of public high school teachers and 33 percent of public middle school teachers report that students being distracted by their cell phones is a major problem in their classroom.¹⁷

26. These studies are consistent with the view that—between time spent redirecting off-task students, time spent managing conflicts that began online, time spent enforcing school phone policies, and time spent supporting emotionally affected students—teachers (and likely other school staff) devote time during their day to dealing with student social media use or the repercussion of student social media use.

¹⁶ <https://www.nea.org/sites/default/files/2024-06/nea-member-polling-on-social-media-personal-devices-and-mental-health-june-20-2024.pdf>.

¹⁷ https://www.pewresearch.org/short-reads/2024/06/12/72-percent-of-us-high-school-teachers-say-cellphone-distraction-is-a-major-problem-in-the-classroom/?utm_source=chatgpt.com.

27. However, these studies do not quantify the amount of time lost. The best evidence outside the context of this litigation that I could find was a dated (2017) survey of teachers in the U.K., which found that the average teacher reported spending over 17 minutes per day to disruptions caused by social media and smart phones.¹⁸ Of course, a survey this old would not take into consideration any changes due to more recent design and marketing efforts made by the defendants, or new platform features. For instance, TikTok only debuted in the United States in 2017, and Instagram Reels debuted in 2020; my understanding from reviewing the complaint in this matter is that both are at issue in the case.¹⁹

28. In short, while these studies confirm that teachers (and other school district staff) believe that social media is disrupting classrooms, adversely affecting student mental health, and thus creating problems for teachers, they generally do not quantify the time lost to these issues.

29. I was not tasked myself with producing an estimate for diverted time. For that, I have relied on the results of a survey conducted by Mr. Robert Klein and the declarations of Brian Lambert, Holly Hammel, Sabrina Salmon, and Julie Shivanonda.²⁰

A. Survey Data Collected from Teachers

30. Mr. Robert Klein surveyed teachers to determine the amount of instructional time (in minutes) that was diverted to deal with student social media use or the repercussions of student social media use on a typical day during the current school year and various points in the recent past. I have relied on Mr. Klein's expertise in designing and conducting the survey.

31. Table 2 summarizes the responses to Mr. Klein's survey from Tucson teachers. It shows the mean number of minutes for each grade-level and period. It also includes the upper and lower bounds for the 95 percent confidence interval around the mean, and the number (N) of observations.

Table 2: Summary of Klein Survey Results for Tucson Teachers

Level	Period	Mean	Lower	Upper	N
Middle	2014	7.5	-6.9	21.9	4
Middle	Pre-COVID	8.6	-0.4	17.5	7
Middle	Return	18.7	0.0	37.5	7
Middle	Last year	17.5	3.3	31.7	10
Middle	Current	17.7	8.7	26.8	22

¹⁸ https://nominet.uk/news/secondary-school-teachers-losing-11-days-teaching-time-year-due-social-media-smartphone-disruptions/?utm_source=chatgpt.com In this study, the disruptions included: "Almost half (46%) of secondary school teachers have experienced pupils using social media smartphone apps during classes, while four in 10 (40%) have experienced pupils' confidence being damaged by social media issues. Meanwhile over a quarter (27%) have experienced social media cyber bullying in class and 17% have had pupils sharing explicit or pornographic content. Half of teachers (50%) say that social media issues such as these are contributing to their pupils achieving lower grades than they could."

¹⁹ Plaintiffs' First Amended Master Complaint (Local Government and School District) (Mar. 27, 2024), ECF No. 729, at ¶¶ 225, 678-86.

²⁰ Decl. of Brian Lambert at ¶¶ 5, 16-19, Decl. of Holly Hammel at ¶¶ 13, 16-18, Decl. of Sabrina Salmon at ¶¶ 6-7, 15-18, and Decl. of Julie Shivanonda at ¶¶ 4, 16-19 and 2025.05.18 Expert Report of Robert L. Klein - Tucson. at 11.

High	2014	11.9	0.0	23.8	8
High	Pre-COVID	32.7	9.8	55.5	12
High	Return	74.0	34.0	114.0	15
High	Last year	73.6	35.0	112.3	18
High	Current	49.5	28.3	70.7	32

Notes: Calculations of raw Klein survey data. Lower and upper represent the lower and upper ranges of a 95 percent confidence interval calculated using bootstrap standard errors.

32. I assume that Mr. Klein's results for the typical day provide a reasonable approximation of time lost during the average instructional day.

33. In order to compute the monetary opportunity cost, I multiply lost time by wages. I do this by converting Mr. Klein's estimate into the share of a teacher-work year. To do this, I multiply Mr. Klein's average by the number of instructional days.²¹ Given that some days are shorter than others (e.g., half-days, early-outs), I adjust the number of days for these shorter days by subtracting the reduced hours from the total and dividing by the number of hours per day.²²

34. Finally, I divide by the number of contract hours 1,552.5 (based on the number of contract days and the number of hours per day).²³

35. The result of these calculations is the share of work-years lost by teachers, as described in Table 3.

Table 3: Estimated share of teacher work-years lost by period

Level	Period	Mean	Lower	Upper
Middle	2014	1%	-1%	4%
Middle	Pre-COVID	2%	0%	3%
Middle	Return	3%	0%	7%
Middle	Last year	3%	1%	6%
Middle	Current	3%	2%	5%
High	2014	2%	0%	4%
High	Pre-COVID	6%	2%	10%
High	Return	13%	6%	21%
High	Last year	13%	6%	20%
High	Current	9%	5%	13%

Notes: Calculation as described in text. Lower and upper use the upper and lower bounds of the confidence interval to calculate the share.

²¹ I obtained the number of instructional days from the Tucson academic calendar.

<https://www.tusd1.org/theme/files/calendar/23-24/TUSD-Calendar-SY-23-24-ENG.pdf>

²² Specifically, the calculation is number of instruction days (176) times 7.5 hours per day minus early out (32 hours) and half day hours (18.75) divided by 7.5.

²³ Teacher contracts include 207 days and entail a 7.5 hour day (analysis of the Tucson data described above). Note that one could also simply divide total pay by contract hours to obtain an hourly wage and use that to compute the value of lost time.

B. Declarations Provided by Other Staff

36. Other testimony also includes estimates of time lost to social media or its repercussions for non-teaching staff. Specifically, the four affidavits referenced above describe the impact of social media on Tucson's principals and various other staff. Table 4 summarizes the estimates from these affidavits for the share of work time spent dealing with social media or its impacts.²⁴

Table 4: Estimated share of work time lost for certain types of staff in Tucson School District

Period	Job	Share	Period	Job	Share
2018	Principal, Elem	2%	2017-2025	Restorative Practice Facilitator	50%
2018	Principal, Middle	11%	2017-2025	Behavior Intervention Monitor	75%
2018	Principal, High	19%	2017-2025	Specialist Counselor	50%
2020	Principal, High	24%	2017-2025	Ex Ed Intervention Specialist	80%
2020	Principal, Middle	20%	2017-2025	Psychology Intern	50%
2020	Principal, Elem	6%	2017-2025	Social Worker	50%
2025	Principal, Middle	33%	2017-2025	Director - Social Emotional Learning	100%
2025	Principal, High	22%	2017-2025	Psychologist	50%
2025	Principal, Elem	8%	2017-2025	Ex Ed Behavior Intervention Specialist	60%
2018	Asst. Principal, Middle	11%	2017-2025	Behavior Specialist	75%
2018	Asst. Principal, Elem	2%	2017-2025	Counseling Intern	50%
2018	Asst. Principal, High	19%	2017-2025	School Counseling Intern	50%
2020	Asst. Principal, High	24%	2017-2025	School Psychologist	50%
2020	Asst. Principal, Middle	20%	2017-2025	Counselor	50%
2020	Asst. Principal, Elem	6%	2017-2025	Program Coordinator - MTSS	40%
2025	Asst. Principal, Middle	33%	2017-2025	Psychology Extern	50%
2025	Asst. Principal, High	22%	2017-2025	Social Worker - Bachelor's	75%
2025	Asst. Principal, Elem	8%	2017-2025	Social Worker - LCSW	80%
			2017-2025	Social Worker - Master's	60%

Note: When the author reported a range, I used the midpoint. When multiple authors reported a share for the same position, I used the average.

²⁴ I also note that, consistent with the opportunity cost approach to damages described above, these affidavits also include discussion of the types of work (and output) that are squeezed by the need to devote more time to social media use and its impacts.

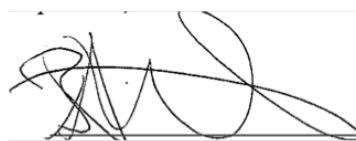
V. CALCULATION

37. Given the above information, calculating past compensatory damages, in the form of lost opportunity costs, is straightforward. It effectively entails multiplying the total compensation amounts in Table 1 (and similar amounts for years not reported in Table 1) by the share of time lost reported in Tables 3 and 4.

38. Table 5 (below) summarizes the total losses based on this calculation.²⁵ Tucson Unified School District has incurred past compensatory damages, in the form of lost opportunity costs, from 2016-2017 through 2023-2024, for teachers in the amount of \$26.3M in wages and \$34.2M in wages and benefits (\$2025, valued at the mean reported loss) for time diverted and efforts expended due to student social media use. Additionally, Tucson Unified School District has incurred past compensatory damages, in the form of lost opportunity costs, from 2016-2017 through 2023-2024 for non-teaching staff in the amount of \$51.1M in wages and \$66.4M in wages and benefits (\$2025) for time diverted and efforts expended due to student social media use. In total, Tucson Unified School District has incurred past compensatory damages, in the form of lost opportunity costs, from 2016-2017 through 2023-2024 for teachers and non-teaching staff for a combined total of between \$77.4M in wages and \$100.6M in wages and benefits (\$2025) for time diverted and efforts expended due to student social media use. A wider range is obtained if one assumes losses at the ends of the confidence interval.

39. The undersigned hereby certifies their understanding that they owe a primary and overriding duty of candor and professional integrity to help the Court on matters within their expertise and in all submissions to, or testimony before, the Court. The undersigned further certifies that their report and opinions are not being presented for any improper purpose, such as to harass, cause unnecessary delay, or needlessly increase the cost of litigation.

May 19, 2025



Bryce A. Ward

²⁵ Detailed results for each population included are available in the “table 5t” and “table 5a” tabs in the “Tucson tables.xlsx” spreadsheet.

Table 5: Summary of total losses (\$2025)

Survey	Base Pay			Base Pay + Benefits		
	Mean share	Low	High	Mean share	Low	High
2017	1,567,049	131,697	3,002,402	2,037,164	171,206	3,903,122
2018	1,755,791	259,974	3,251,608	2,282,529	337,966	4,227,091
2019	2,066,437	413,774	3,719,100	2,686,368	537,907	4,834,830
2020	2,329,693	569,682	4,089,704	3,028,601	740,587	5,316,615
2021	5,049,053	1,960,922	8,137,183	6,563,769	2,549,199	10,578,338
2022	4,416,279	1,769,385	7,063,173	5,741,163	2,300,201	9,182,125
2023	4,634,046	1,942,858	7,325,234	6,024,259	2,525,715	9,522,804
2024	4,498,614	1,960,281	7,036,946	5,848,198	2,548,366	9,148,030
Total	26,316,962	9,008,574	43,625,351	34,212,051	11,711,146	56,712,956
	Base + Supplemental			Base Pay + Benefits + Supplemental		
	Mean share	Low	High	Mean share	Low	High
2017	1,567,049	131,697	3,002,402	2,037,164	171,206	3,903,122
2018	1,945,661	287,815	3,603,507	2,472,399	365,807	4,578,990
2019	2,328,175	466,529	4,189,821	2,948,106	590,661	5,305,551
2020	2,612,392	639,111	4,585,672	3,311,300	810,016	5,812,583
2021	5,643,360	2,192,894	9,093,826	7,158,076	2,781,171	11,534,981
2022	5,138,873	2,060,445	8,217,301	6,463,757	2,591,261	10,336,253
2023	5,647,193	2,367,940	8,926,447	7,037,407	2,950,797	11,124,017
2024	5,416,633	2,364,083	8,469,183	6,766,218	2,952,167	10,580,267
Total	30,299,336	10,510,514	50,088,159	38,194,426	13,213,086	63,175,763

Notes: Calculation described in text. Shares for years not reported in the survey or in the affidavits interpolated linearly.

Affidavits	Base pay			Base pay + benefits		
2017	4,549,850			5,914,805		
2018	5,781,736			7,516,256		
2019	6,383,384			8,298,399		
2020	6,942,873			9,025,735		
2021	6,683,900			8,689,069		
2022	6,539,469			8,501,309		
2023	7,064,706			9,184,117		
2024	7,151,243			9,296,616		
Total	51,097,159			66,426,306		
	Base + Supplemental			Base Pay + Benefits + Supplemental		
2017	4,549,850			5,914,805		
2018	5,781,736			7,516,256		
2019	6,383,384			8,298,399		
2020	6,942,873			9,025,735		
2021	6,683,900			8,689,069		
2022	6,546,285			8,508,125		
2023	7,064,706			9,184,117		
2024	7,155,632			9,301,005		
Total	51,108,365			66,437,512		
Combined Survey + Affidavit total	\$77,414,121			\$100,638,357		
Combined Survey +Affidavit (incl Supplemental)	\$81,407,701			\$104,631,938		

APPENDIX A: WARD CV

Dr. Bryce Ward

Ph.D. Economics, Harvard University
B.A. Economics and History, University of Oregon

Dr. Ward is co-founder of ABMJ Consulting. Previously, he served as a Senior Research Professor/ Associate Director at the Bureau of Business and Economic Research at the University of Montana, as a Research Associate and the University of Montana's Rural Institute and as Senior Economist at ECONorthwest, a Portland, OR based economics consulting firm.

Dr. Ward's areas of expertise include econometric analysis and applied microeconomics -- including urban and regional economics, labor economics, health economics, public finance, and environmental and natural resource economics. Dr. Ward has applied his expertise to a variety of projects involving litigation support and policy analysis. He has provided oral and written testimony in dozens of court, legislative, or administrative proceedings. Dr. Ward has taught courses in microeconomic theory, econometrics, labor economics, public finance, environmental and natural resource economics, and social economics at Harvard University, Lewis and Clark College, the University of Oregon, Portland State University, and the University of Montana.

Litigation Support Projects

1. Labor

- Calculated economic damages from lost wages, earnings capacity, etc. and testified in wrongful termination trials. *Various clients – Various locations.*
- Organized data and conducted statistical analysis to evaluate claims of discrimination in employer discrimination lawsuits. *Various confidential clients – Various locations.*
- Provided written and oral testimony on the economics and costs/benefits of union release time. *Martin & Bonnet; Sherman Howard. – Phoenix, AZ*
- Provided written testimony describing the expected impact of a mass layoff on coal miners, their households, and their community (long-term earnings, health, etc.). – *Baker Hostetler – Cleveland, OH*
- Provided testimony and conducted statistical analysis to determine if an observed decline in productivity at the Port of Portland's container terminal reflected union slowdown in response to a labor dispute. *Schwabe Wyatt & Williamson – Portland, OR.*

- Evaluated plaintiff's expert report and helped prepare cross-examination questions in a case involving lost bonus payments and lost profits from the termination and alleged defamation of a financial advisor. *Shepherd Mullin Richter & Hamilton – New York*
- Prepared testimony regarding the comparability of jurisdictions and their compensation schemes in preparation for a public interest arbitration involving sheriff's deputies. *Winterbauer Diamond – Seattle*
- Provided testimony and conducted statistical evaluation of alleged discrimination against African-Americans union workers on a large construction project. *Winterbauer Diamond -- Seattle*
- Provided testimony evaluating plaintiffs' expert report, presenting evidence of failure to mitigate, and calculating damages in a case involving the alleged wrongful termination of 25 Somali immigrants. *K&L Gates -- Seattle*
- Prepared testimony in preparation for a public interest arbitration regarding a timber-dependent county's ability to pay higher compensation to sheriff's deputies in light of potential loss of federal timber payments. *Confidential Client*
- Developed an analytical framework, gathered data, and conducted analyses of current market conditions for workers in comparable jobs and comparable communities as precursor to public-interest arbitrations involving transit districts. *Bullard Smith Jernstadt Wilson – Portland, OR.*
- Described the potential impact of the financial crisis, recession, potential deflation, and other related uncertainty on labor markets and labor negotiations subject to public interest arbitration. *Bullard Smith Jernstadt Wilson – Portland, OR.*
- Testified about the reasons and methods for adjusting wages for changes in the cost of living based on the Consumer Price Index (CPI) and the long-term consequences of not adjusting wages during periods of deflation. *Bullard Smith Jernstadt Wilson – Portland, OR.*
- Summarized economic forecasts for the Portland area, identified potential threats that could cause the economy to deviate from the forecasts, and outlined the implications of the forecast for negotiations between the Portland Police Officers' Association and the City of Portland. *Aitchison & Vick – Portland, OR.*
- Analyzed historical wage and benefit growth for sheriff deputies relative to other public and private sector employees in preparation for labor bargaining. *Bullard Smith Jernstadt Wilson – Portland, OR.*
- Provided written testimony on the effects of proposed increases in piloting fees on local ports and the local economy. *Columbia River Bar Pilots and Haglund Kelly Horngren and Jones – Astoria, OR.*

- Reviewed and conducted analyses in order to determine if specialty forest product harvesters should be considered independent contractors or employees of the “brush picking sheds” that issued their harvester permits. *Talmadge/Fitzpatrick – Washington*.

2. Business Damages

- Calculated lost profits associated with alleged failure to pay and subsequent loss of bonding capacity for a construction firm. *Baldwin Law – Bozeman, MT*.
- Calculated lost profits associated with alleged wrongful termination of direct repair program contract termination. *Confidential Client*.
- Evaluated plaintiff’s alleged damages associated with alleged business interruption and reputation damage in a bail bonds business. *The Hustead Law Firm – Denver, CO*
- Provided testimony calculating damages associated with a delayed real estate sale. *Tarlow Stonecipher Weamer & Kelly – Bozeman, MT*
- Provided testimony evaluating plaintiff’s alleged damages in a dispute about a flooded mine tunnel. *Laird Cowley – Missoula, MT*
- Provided testimony evaluating plaintiff’s expert damages and provided alternative estimates in a case involving alleged delay in certification of purebred cattle. *Laird Cowley – Missoula, MT*
- Provided testimony calculating business damages stemming from a former employee shutting down the firms’ internet access. *St. Peter’s Law Offices – Missoula, MT*
- Provided testimony calculating damages associated with a lost real estate development. *Datsopoulos, MacDonald, Lind – Missoula, MT*
- Provided testimony evaluating plaintiff’s damages calculation in a case involving lost profit and lost business value stemming from alleged fraud and breach of a contract. *Garlington Lohn Robinson – Missoula, MT*
- Provided testimony evaluating plaintiff’s expert damages calculation in a case involving lost profit and lost tax advantages from a failed real estate transaction. *Peck, Hadfield, Baxter & Moore – Logan, UT*
- Provided testimony evaluating plaintiff’s expert damages calculation in a case alleging harm from the improper implementation of Montana’s Department of Transportation Disadvantaged Business Entity program. *Montana Department of Transportation, MT*

- Provided testimony about damages from the alleged misappropriation of confidential information, including pricing information. *Wilson Sonsini Goodrich & Rosati – New York, New York*
- Provided written testimony evaluating plaintiff's expert's lost profits analysis in a matter involving alleged substandard performance by a call center. *Arnold Gallagher Percell Roberts & Potter -- Oregon*
- Calculated damages suffered by an auto dealership and service department stemming from the violation of non-solicitation and non-compete clauses in an asset purchase agreement. *Foster Pepper – Oregon.*
- Reviewed plaintiff's expert report and provided questions for deposition and trial for a business damages case involving breeding dogs. *Schedler Bond -- Washington*
- Calculated lost profits to an oyster farm stemming from chemical contamination of their oyster beds. *Confidential client – Pacific Northwest.*
- Analyzed firm losses resulting from former employees' breaches of restrictive employment-contract covenants regarding future employment with a competitor. *Confidential client – Oregon.*

3. Anti-Trust & Competition

- Testified regarding the economic aspects of alleged anticompetitive behavior in a market for outpatient diagnostic imaging services in several markets. *Various clients – Various locations.*
- Analyzed the economic issues of class certification and damage calculations related to alleged antitrust violations in the market for residential lots. *Hagens Berman Sobol Shapiro, LLP – Boise, ID.*
- Provided written testimony regarding the presence of competition in a market for private prisons and the likelihood of substantial competitive harm to private prison operators from a Freedom of Information Act (FOIA) request. *Stephen Rahe – Portland, OR.*
- Estimated share of LCD TVs, LCD computer monitors, and notebook computer monitors were purchased by Oregon consumers and state and local governments as part of a price fixing lawsuit. *Oregon Department of Justice – Oregon.*
- Conducted economic analysis on economic damages attributed to alleged antitrust actions in the market for concert-promotion services in the Portland area. *McNamer and Company – Portland, OR*

4. *Environment & Natural Resources*

- Identified and estimated the value of economic costs imposed by an oil spill from a Chevron pipeline. *SWCA Environmental Consultants – Utah.*
- Described the potential economic damages suffered by municipalities in Alabama as a result of the *Deepwater Horizon / BP* oil spill in the Gulf of Mexico. *Cunningham Bounds – Orange Beach, AL.*
- Conducted a rate analysis for a stormwater utility in a large metropolitan area. *Confidential client – Confidential location.*
- Conducted economic analyses on the economic aspects of a breach of contract claim over a reasonable price to provide water to, and process effluent from, a Georgia-Pacific paper mill. *Schwabe Williamson & Wyatt, PC – Hasley, OR.*
- Calculated natural resource damages associated with a Superfund site using a Habitat Equivalency Analysis (HEA). *Quapaw Tribe of Oklahoma – Oklahoma.*
- Described the impact of a change in recreational harvest allocation rules on the economic health and stability of the small businesses that make up the commercial Dungeness crab industry in Puget Sound. *Puget Sound Crabbers Association – Washington.*
- Evaluated the potential economic effects of the U.S. Department of Agriculture and California Department of Food and Agriculture's proposed eradication of the Light Brown Apple Moth. *Earthjustice – California.*
- Calculated profit disgorgement earned while violating California emissions laws. *California Attorney General – California.*
- Evaluated a contingent valuation study of the proposed development of a wind farm. *Perkins Coie – Nantucket, MA.*
- Evaluated the U.S. Environmental Protection Agency's draft report on groundwater and soil remediation scenarios for a creosote-contaminated Superfund site. *Confidential client – Washington.*
- Assisted in an analysis that compared and contrasted benefits and costs, stemming from the use in California of MTBE-oxygenated gasoline with those stemming from the use of ethanol-oxygenated gasoline to determine if refiners could have used ethanol to meet federal reformulated gasoline mandates instead of MTBE during the 1990s. *Various clients – Various locations.*

5. *Right-Of-Way Studies*

- Provided written testimony to the Federal Communications Commission (FCC) that described the results of an original evaluation into the effect of municipal right of

way fees on broadband deployment and adoption using both economic theory and statistical analysis. *Miller Van Eaton – Nationwide*.

- Provided oral and written testimony regarding economic issues related to municipal right-of-way fees in New Orleans. *Goins Aaron and City of New Orleans – New Orleans, LA*.
- Provided written testimony to the Federal Communications Commission (FCC) regarding the economic aspects of allowing local governments to charge telecommunications providers for access to government-owned or managed property. *Miller Van Eaton – Nationwide*.
- Addressed the economic issues of telecommunications firms' challenge, under the Telecommunications Act of 1996, to the City of Portland's franchise-fee agreements for use of the municipal right-of-way. *Miller Van Eaton and City of Portland – Portland, OR*.

6. Real Estate

- Calculated economic damages associated with delayed real estate developments. – *Various clients – Various locations*.
- Developed automated valuation models to statistically assess the value several thousand properties in Arizona and Nevada, and provided oral and written testimony on the economic aspects and harm, if any, to plaintiffs, from an alleged scheme that inflated the appraised market value of real estate. *Hagens Berman – Arizona and Nevada*.
- Provided written testimony on the economic aspects and harm, if any, to plaintiffs, from an alleged scheme that inflated mortgage costs without proper disclosure. *Hagens Berman – Arizona*.
- Described the economic costs of a pipeline rupture and related oil spill on residential and public property values. *Salt Lake City – Salt Lake City, UT*.
- Analyzed the impacts of Measure 37 (property rights limitation) on the State of Oregon. *Department of Justice, Office of the Attorney General – Oregon*.
- Prepared testimony regarding the national and Salem, OR real estate markets for a condemnation case. *Garrett, Hemann, and Robertson P.C. – Oregon*.

7. Personal Injury & Wrongful Death

- Calculated economic damages in wrongful death lawsuits. *Various clients – Various locations*.
- Calculated lost wages and presented expert testimony in personal injury cases. *Various clients – Various locations*.

- Calculated non-economic damages to a father denied access to his child for 17 years based on expenditures by parents on children. *Jamin Law Group – Alaska.*

8. Other

- Described methodology for evaluating the impact of marketing on opioid use in Canada – *Camp, Fiorente, Matthews, Mogerman – Vancouver, BC*
- Calculated economic damages associated with alleged improper water and wastewater impact fees and discussed the economic incidence of impact fees. *Laird Cowley – Missoula, MT*
- Provided an opinion on the valuation of two convenience stores/ gas station/casinos. *Laird Cowley – Missoula, MT*
- Provided testimony calculating the value of a minority stake in the ammunition manufacturer. *Laird Cowley – Missoula, MT*
- Developed a model to estimate damages suffered by employees as a result of alleged violation of state meal and rest break rules. *Winterbauer Diamond – Seattle, WA*
- Calculated economic damages stemming from an alleged breach of cost and revenue sharing agreements among former law partners. *Laird Cowley – Missoula, MT*
- Provided an opinion regarding the value of a minority stake in manufactured home community. *Reep, Bell, Laird, & Jasper, Missoula, MT.*
- Provided written testimony regarding changes in the market for garbage hauling in Missoula, MT. *Rhoades, Siefert, Erickson – Missoula, MT*
- Prepared a report describing economic and potential non-economic damages for a person who was wrongfully convicted and spent 24 years in jail. *Reep, Bell, Laird, & Jasper, Missoula, MT.*
- Estimated the value of a private real estate brokerage. *Reep, Bell, Laird, & Jasper, Missoula, MT.*
- Prepared written and oral testimony on the value of a minority share of a closely held private corporation. *Reep, Bell, Laird, & Jasper, Missoula, MT.*
- Prepared a report that described the appropriate discount rate to use to compensate a group of developers owed a lump-sum amount for prior investments in the development of local water infrastructure. *Reep, Bell, Laird, & Jasper, Missoula, MT.*
- Evaluated California's methods for validating ballot initiative petitions. *Bell, McAndrews & Hiltachk, Sacramento, CA.*

- Testified in Oregon tax court regarding the extent to which Serenity Lane (a non-profit drug and alcohol treatment center) gives to charity through care scholarships, pricing its services below market rates, offering an intern education program, and performing community education. *Arnold Gallagher Percell Roberts & Potter – Oregon*
- Testified before the Oregon legislature regarding proposed legislation before the Oregon House that amends ORCP 32 by repealing subsection K and, therefore allowing recovery of UTPA statutory damages (currently \$200) in class actions. *Confidential client – Oregon.*
- Calculated reimbursements to families who adopted foster children as part of a class action settlement. *Johnson Johnson Larson and Schaller – Oregon.*
- Evaluated statistical evidence of cheating on a test and testified before administrative review board at a university. *Christie White – Oregon*

Representative Projects on Other Topics

9. Regional Economics

- Provided analysis, presentation, and support for the development of a Community Economic Development Strategy (CEDS). Missoula Economic Partnership – *Missoula, MT*
- Described and evaluated Montana’s bioscience sector – Missoula Economic Partnership – *Missoula, MT*
- Prepared a report describing the state of entrepreneurship in Montana – *Montana Chamber of Commerce – Helena, MT.*
- Analyzed the economic contribution of the Missoula County Fairgrounds to Missoula’s economy – *Missoula County Fairgrounds, Missoula, MT*
- Described the contribution of health care to Billings, MT’s economy. *Big Sky Economic Development Agency – Billings, MT*
- Described trends in key economic indicators (e.g., gross metropolitan product, employment, personal income per capita) in the Portland Area and evaluated them relative to other comparison areas. *Portland Business Alliance – Oregon*
- Defined and described Portland’s traded sector and explained how it contributes to employment growth, income growth, new business formation, and overall regional economic health. *Portland Business Alliance – Oregon*

- Performed a quantitative and qualitative analysis of the economic contributions of Oregon State University's College of Engineering to the regional economy. *Oregon State University College of Engineering – Oregon.*
- Performed a quantitative and qualitative analysis of the economic contributions of The Evergreen State College on the regional and state economies. *The Evergreen State University – Washington.*
- Performed a quantitative and qualitative analysis of the economic contributions of Oregon's Cultural Trust to state economies and assessed the effectiveness of the Oregon Cultural Trust Tax Credit. *Oregon Cultural Advocacy Coalition – Oregon.*
- Conducted data analysis to describe the role of Washington County and Portland's Westside in the regional economy. *City of Hillsboro -- Oregon*
- Conducted data analysis and prepared a report that defined and described Portland's manufacturing and explained how it may contribute to the regional economy by paying higher wages, promoting innovation, and boosting the traded sector. *Portland Business Alliance – Oregon*
- Evaluated the effect of enterprise zone tax incentives on employment growth using a regression-discontinuity analysis of longitudinal establishment-level data. *Oregon Economic Development Association – Oregon*

10. Labor Markets

- Prepared a report on the "State of the Workforce" in Missoula, MT – *Missoula Economic Partnership*
- Evaluated gender, racial, and age disparities in performance evaluations and promotion decisions at a Fortune 500 company. *Confidential client.*
- Designed survey and prepared article investigating women's low rates of participation in low-stakes "pre-entrepreneurial" activities. *Kauffman Foundation, Kansas City*
- Investigated methods and data for introducing greater flexibility into union contracts. *Association of General Contractors Oregon-Columbia Chapter – Oregon.*
- Described the methods used to calculate hourly billing rates, calculated plausible billing rates for local government employees, and compared these rates to the hourly rates charged by the Lane Council of Governments. *Lane Council of Governments – Eugene, OR.*
- Used IRS tax migration data and the American Community Survey to evaluate the impact of income tax differentials between Oregon and Washington on migration within the Portland-Beaverton-Vancouver, OR-WA MSA. *Association of Oregon Industries – Oregon and Washington.*

- Created a large longitudinal data set of Harvard College students that matched labor market and family outcomes obtained from surveys administered 15-30 years following graduation to undergraduate records. Dr. Ward supervised the creation of the undergraduate database, drafted the survey instrument, managed survey distribution and collection, and conducted preliminary data analysis. *Office of the President, Harvard College – Nationwide.*
- Calculated the potential economic costs associated with proposed change in Oregon’s meal and rest break rule by empirically identifying potentially affected workers and employers, modeling potential employer responses, and identifying values for model parameters. *Michael Lilly Attorney – Oregon.*

11. Natural Resources

- Examined the impacts of implementing the King County Wastewater Treatment Division’s Combined Sewer Overflow Control Plan on ratepayers and assessed their financial capacity to bear these impacts. *King County Wastewater Treatment Division – King County, WA.*
- Helped develop an analytical approach to describe the short-term and long-term benefits and costs of clean-up and remediation alternatives for the Portland Harbor Superfund Site. *City of Portland – Portland, OR.*
- Analyzed the effect of Seattle’s Natural Drainage (low impact development) Projects on neighboring property values using a hedonic regression analysis and data from county assessors’ records. *Water Environment Foundation – Seattle, WA.*
- Described the growth in the market for third-party certified forest products and discussed the reasons why firms choose to pursue certification.

12. Education

- Helped design a long-term evaluation strategy, including both quantitative and qualitative methods, for the “Dreamer School,” a program designed to promote college attendance for an entire elementary school. *I Have a Dream Foundation – Oregon.*
- Designed and implemented a randomized evaluation that employed longitudinal student and school data to demonstrate the effects of Safe and Civil Schools’ positive behavior support programs on elementary schools in the Fresno Unified School District. *Randy Sprick’s Safe and Civil Schools – Fresno, CA.*
- Evaluated the effectiveness of the South Shore School, a public-private partnership school in Seattle, using a quasi-experimental regression analysis and longitudinal student data. *Seattle Public Schools – Seattle, WA.*
- Evaluated the effectiveness of ASPIRE, a program to increase college enrollment among Oregon high school students, using a regression analysis and longitudinal

student data that matched student K-12 records with college enrollment data. *Oregon Community Foundation – Oregon.*

- Developed a district report card system for several Oregon school districts based on longitudinal student data. *Chalkboard Project – Oregon.*
- Evaluated the effectiveness of Pre-K and K programs in Bremerton, Washington using a regression analysis on longitudinal student data. *Bremerton School District – Bremerton, WA.*
- Testified before Oregon legislature regarding the benefits of using block grants for funding school transportation systems. *Chalkboard Project – Oregon.*
- Developed regression models to calculate funding levels for student transportation in Washington school districts and developed linear programming tools to evaluate the efficiency of district transportation spending. *Washington’s Office of the Superintendent of Public Instruction – Washington.*
- Analyzed and presented results of a survey regarding methods for improving efficiency in Oregon schools. *Chalkboard Project – Oregon.*
- Reviewed literature on motivations for and effects of mergers between institutions of higher education. *Confidential client – Various locations.*
- Developed a method for using longitudinal student data to calculate and report student achievement growth (aka a school value-added-model (VAM)) as part of a school accountability program in Seattle, Washington. *Seattle Public Schools – Seattle, WA.*
- Used longitudinal data to describe the Hispanic-White and Black-White achievement gaps in Oregon schools. *Chalkboard Project – Oregon.*
- Described the potential economic effects of eliminating the achievement gaps in Oregon’s schools on the state’s economy. *Chalkboard Project – Oregon.*
- Reviewed and evaluated current research on the effectiveness of the Safe and Civil Schools program, and worked with clients to develop and implement additional program evaluation. *Randy Sprick’s Safe and Civil Schools – Washington.*

13. Healthcare

- Prepared a presentation on COVID’s impact on Montana’s economy, COVID’s impact on health and healthcare in Montana, and long-term issues on health and healthcare in Montana – *Montana Healthcare Foundation*
- Prepared a report that examined the economic impact of Medicaid expansion in Montana – *Montana Healthcare Foundation; Headwaters Foundation*

- Prepared a report describing the fiscal impacts of Medicaid expansion on states' budgets. *Commonwealth Fund – New York, NY.*
- Designed evaluation of Montana's Medicaid Expansion Waiver (HELP Program) – *Montana Department of Public Health and Human Services – Helena, MT*
- Evaluated Montana's Patient Centered Medical Home (PCMH) program – *Montana Commissioner for Securities and Insurance – Helena, MT*
- Evaluated effects of pain, fatigue, and depressed mood on individual participation in daily activities. *University of Montana Rural Institute for Inclusive Communities – Missoula, MT*
- Prepared presentation on drivers and potential solutions to rising health care costs and discussed the impact of high health care costs on large employers. *Blue Cross Blue Shield of Montana – Helena, MT.*
- Prepared report describing characteristics of Montanans who would be eligible for Medicaid if Montana accepted the ACA Medicaid Expansion. *Bureau of Business and Economic Research. Missoula, MT.*
- Prepared report and presentation describing Native American health and health insurance coverage in Montana. *Confidential Client.*
- Reviewed and evaluated current research on the impact of increased hospital supply on local health care markets. *SEIU Local 49 – Portland, OR.*
- Reviewed the literature on the prevalence, preventability, and expense associated with medical injuries and medical errors and used estimates from this literature to describe the potential economic cost to Oregonians caused by medical errors. *Oregon Trial Lawyers Association – Oregon.*
- Produced a primer on health care cost that addressed nine common questions about health care and health care costs. *Regence Blue Cross-Blue Shield of Oregon – Oregon.*
- As part of on-going labor negotiations, provided an independent analysis of a hospital systems financial health based on common financial indicators and health care spending forecasts. *SEIU Local 49 – Oregon.*

14. Public Policy

- Estimating the potential economic impact of funding cuts to Oregon's courts. *Oregon Trial Lawyers Association – Oregon.*
- Performed a quantitative and qualitative analysis of the economic contributions of Oregon State University on the regional and state economies. *Oregon State University – Oregon.*

- Led a benefit-cost analysis that compared the economic benefits and costs of developing 300 acres of West Hayden Island into a port facility and restoring the remaining 500 acres to leaving all 800 acres in their current state. *City of Portland – Portland, OR.*
- Reviewed the economic literature and described potential impact of proposed income tax increase on taxable income and economic growth. *Oregon Business Council – Oregon.*
- Reviewed the economic literature on the effects of STEM education, conducted data analysis, and produces a simple economic model designed to help educate policy makers about the potential returns to investments in STEM. *Oregon Business Council – Oregon.*
- Developed a model and analyzed data to estimate gross revenues for video, voice, and data services at the city level. *League of Oregon Cities – Oregon.*
- Provided data collection services to determine garbage and yard debris can weights and set-out rates for Eugene residents. *City of Eugene – Eugene, OR.*

15. Real Estate & Land Use

- Conducted a market analysis for a proposed real estate development in Belgrade, MT – *Confidential Client*
- Estimated the potential economic effects of future residential rural development on real estate values. *San Luis Obispo County – San Luis Obispo County, CA.*
- Analyzed the effect of Portland's Intertwine (a network of open spaces) on property values in the Portland-Vancouver metropolitan area using a hedonic regression analysis and data from county assessors' records. *Metro – Portland, OR.*
- With a team of researchers at Harvard University, analyzed the effect of local land-use regulations on housing supply and housing prices for 187 communities in Eastern Massachusetts. *Pioneer Institute for Public Policy Research – Massachusetts.*
- Detailed the sources of housing-price cycles at the neighborhood level. *Pioneer Institute for Public Policy Research – Boston, Massachusetts.*
- Applied the principles of benefit-cost analysis to help Clackamas County understand the full range of economic benefits and costs associated with improving its score on FEMA's Community Rating System. *University of Oregon – Clackamas County, OR.*
- Worked with emergency managers at the University of Oregon to identify the tradeoffs associated with various hazard mitigation and response plan options, gathered data to evaluate these tradeoffs, and helped calculate the economic benefits and costs associated with different options. *University of Oregon – Eugene, OR.*

Academic Publications

- "Events Across the Life Course Contribute to Higher Mobility Impairment Rates in Rural US." *Rural Disability and Community Participation*, 16648714, 22. Ipsen, C., Ward, B., & Myers, A. (2022).
- "Effects of an Exercise Intervention on Participation Reported by People with Disabilities: A Mixed Methods Randomized Trial." *Disability and Health Journal*, 101272. Raveslout, C., Myers, A., Santasier, A., & Ward, B. (2022).
- "Effects of a consumer driven home modification intervention on community participation for people with mobility disabilities." *Disability and Health Journal* Greiman, L., Raveslout, C., Goddard, K. S., & Ward, B. (2022).
- "Is the presence of home entrance steps associated with community participation of people with mobility impairments?" *Disability and Health Journal*, 101183. Raveslout, C., Myers, A., Greiman, L., Ward, B., Shinnick, K., & Hall, J. (2021).
- "Effects of a consumer driven home modification intervention on community participation for people with mobility disabilities." *Disability and Health Journal*, 101210. Greiman, L., Raveslout, C., Shinnick-Goddard, K., & Ward, B. (2021).
- "Health status changes with transitory disability over time." *Social Science & Medicine*, 244, 112647 Myers, A., Ward, B., Wong, J., & Raveslout, C. (2020).
- "Transitory and Enduring Disability Among Urban and Rural People." *The Journal of Rural Health*. Sage, R., Ward, B., Myers, A., & Raveslout, C. (2019).
- "Life starts at home: bathing, exertion and participation for people with disabilities." *Archives of Physical Medicine and Rehabilitation* Greiman, L., P. Fleming, B. Ward and C. Raveslout.
- "Disability Items From the Current Population Survey (2008-2015) and Permanent Versus Temporary Disability Status" *American Journal of Public Health*. 2017, Ward, B., A. Meyers, J. Wong, and C. Raveslout.
- "Why Stay Home? Ecological Momentary Assessment of a Community-Based Mixed Impairment Sample" *Disability and Health* 9(2), Raveslout, C, B. Ward, T. Hargrove, J. Wong, N. Livingston, L. Torma, C. Ipsen.
- "Scale-up of Safe & Civil Schools' Model for school-wide positive behavioral interventions and supports." *Psychology in the Schools* 53(4):339-358. Smolkowski, K., Strycker, L., & Ward, B
- "A Randomized Evaluation of the Safe and Civil Schools Model for Positive Behavioral Interventions and Supports at Elementary Schools in a Large Urban School District." *School Psychology Review* 42(3):317-333, Ward B. and R. Gersten. 2013,

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“Homelessness in Missoula” Missoula Economic Partnership Fast Action Forum, February 2024.

“The economic effects of Medicaid expansion in Montana: A review” Presentation to Montana State Legislature MARA Committee, January 2024.

“The Future of Montana.” University of Montana Bureau of Business and Economic Research 2023 Economic Outlook Seminar. January-February 2023.

“Montana’s Economy: What’s going on and how do we do better?” Montana University System. December 2022.

“Missoula’s economic challenges: Looking back and looking forward” Missoula Economic Partnership Annual Meeting, October 2022

“Getting to Happily Ever After in Small Business Valuation.” Montana Tax Institute. October 2022.

“Montana’s Economy: The post-COVID rollercoaster.” State Bar of Montana Annual Bankruptcy Seminar. July 2022.

“Defining the issue: Workforce.” Big Sky Business Innovation Summit. May 2022.

“Why is it so hard to hire? Where are all the workers?” Glacier Country Tourism Summit, November 2021.

“The simple story of the COVID economy.” State Bar of Montana Annual Bankruptcy Seminar, August 2021.

“Racial and ethnic inequity: Understanding and addressing local government’s contribution.” University of Montana Public Service Academy, August 2021.

“The economy is going crazy!!! What’s going on?” Missoula Gives, May 2021.

“Missoula’s economy: What’s going on and how can we do better?” Missoula Economic Partnership, December 2020.

“How to grow a bioscience cluster.” Big Sky Business Innovation Summit, October 2020.

“The COVID economy: Where are we now, and where might we be headed?” State Bar of Montana Annual Bankruptcy Seminar, August 2020.

“Potential impacts of the coronavirus on the economy.” Missoula Marketwatch, March 2020.

“The Economics of Injury, Pain, and Opiate Addiction in Montana.” Governor’s Conference on Workers’ Compensation, August 2019.

“Montana’s Economy: What’s going on and how can we do better?” State Bar of Montana Annual Bankruptcy Seminar, August 2019.

“The Economics of Addiction in Montana” Montana Opioid & Addictions Summit, October 2018.

“The economic impact of Medicaid expansion in Montana.” State Chamber of Oklahoma Health Care Summit, October 2018.

“The State of Entrepreneurship in Montana.” Montana Chamber of Commerce 2018 Economic Update Series, August 2018.

“Better off in Billings – Data for talent attraction” Billings’ Workforce Council Annual Meeting, April 2018.

“Healthcare in Montana: Can consumer centrism move us closer to the ideal?” *Healthcare at a Crossroads*, Healthcare policy conference, Montana State University, April 2018.

“An economist’s perspective on pulmonary health.” *Big Sky Pulmonary Conference*, March 2018.

“Is single-payer the solution (or part of the solution) to our healthcare problems?” Missoula League of Women Voters Forum, March 2018.

“The Future of Higher Education” Bureau of Business and Economic Research 2017 Economic Outlook Seminar Tour (Jan-Mar 2018)

"Ugh! This is awful!: The economic consequences of wildfire smoke." State of Missoula, January 2018.

"The Contribution of Health Care to Montana's Economy" Montana Tax Payer Association Annual Conference, December 2017.

"Missoula's economy: What's going on and how can we do better?" Leadership Missoula, November 2017.

"Understanding and mitigating the economic costs of cancer." Montana Cancer Action Network Policy Conference, Keynote Address, November 2017.

"Montana's economy: What's going on and how can we do better?" Missoula Federal Credit Union Board Retreat, October 2017.

"How to build a regional economy: the role for talent attraction." Montana Economic Developers Association Fall Conference, October 2017.

"The significance of health care to Western States' economies" Western States Association of Tax Administrators Conference, October 2017.

"A health economist's view of the world and Mountain Pacific Quality Health's role in it." Mountain Pacific Quality Health Foundation Board Meeting, August 2017.

"Building Montana's Health Care Workforce: The role of talent attraction." Innovate Montana Symposium, July 2017.

"Meet Me in Montana: Developing Talent Attraction Tools for Montana" BillingsWorks, April 2017.

"The High Wage Jobs Puzzle: Finding Montana's Place in the New Geography of Jobs" Keynote Address: Bureau of Business and Economic Research 2017 Economic Outlook Seminar Tour; Montana Society of CPAs Industry Conference, Jan - Mar 2017.

"The Contribution of Health Care to Montana's Economy" Bureau of Business and Economic Research 2017 Economic Outlook Seminar Tour (Jan-Mar 2017)

"Life Starts at Home: Linking Home Environment and Quality of Life for People with Disabilities." Affordable and Accessible Housing for Vulnerable Older Adults and People with Disabilities Living in the Community: A Workshop, National Academies of Science, Engineering, and Medicine, 12/2016.

"Missoula's Economy: A Framework" Missoula Economic Partnership, 10/2016; Missoula City Council Committee of the Whole 12/2016.

"The Contribution of Health Care to Flathead County (MT)'s Economy." Kalispell Chamber of Commerce, 8/2016

"Time Use at Home and in the Community." National Association for Rehabilitation Research and Training Centers Annual Conference, 5/2016

"Housing Characteristics, Home Experiences, and Community Engagement of People Who Report Impairment." RTC: Rural State of the Science webinar, 6/2016.

"Finding Missoula's Place in the New Geography of Jobs." Missoula Rotary Club, 6/2016.

"Employment Outcomes for Montana University System Graduation: Evidence from Administrative Data." University of Montana School of Business Administration, 10/2015.

"Moving beyond time and money: The effect of effort scarcity on individual choices." University of Montana, Department of Economics Seminar, 11/2015.

"Understanding and Increasing Women's Participation in Pre-Entrepreneurial Activities" University of Montana School of Business Administration. 4/2016

"Health Care in Montana: The next 10 years" 2016 BBER Economic Outlook.

"Economic Impact of the Western Montana Family Residency" Western Montana Family Medical Residency Board Meeting, 10/2015

"Revisiting the Economic Impacts of Medicaid Expansion" Association of University Business and Economic Research (AUBER) Fall Conference, 10/2015

"The Future of Health Care Costs – Impacts on your business" – Blue Cross Blue Shield of Montana Employer Summit (Keynote) 8/2015.

"Eight Questions about Health Economics" Healthcare Financial Managers Association (Keynote) 4/2015.

"Healthcare Headlines: Changing Access, Managing Costs, Improving Quality." 2015 BBER Economic Outlook.

"Recent trends in the microeconomics of family medicine practices." Didactic presentation to Family Medicine Residency of Western Montana 1/2015.

"The economics of Medicaid Expansion in Montana." Montana Health Care Forum. 12/2014

"A Primer on Health Care Costs: Brief answers to nine important questions." Didactic presentation to Family Medicine Residency of Western Montana 11/2014

"The contribution of health care to Billings' Economy: Final Report." Big Sky Business Healthcare Summit 11/2014

"The Culture of Non-Work?: Quality of Life and the College Educated Workforce in Oregon." Association of University Business and Economic Research (AUBER) Fall Conference, 10/2014.

"Health and Health Care in Montana." Montana Healthcare Foundation Board of Trustees 8/2014

"The economic impact of health care on Billings' economy" Big Sky Business Healthcare Summit 7/2014

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"The contribution of health related industries to Billings' economy." Big Sky Business Healthcare Summit 7/2014

"The future of healthcare in Billings." Big Sky Business Healthcare Summit 7/2014

"Economic Contribution of Health Care to Rural Economies." Northern Rockies Health Care Innovation Summit, Fairmount, MT, June 10, 2014

"Assessing the Health of the Missoula Economy." National Association of Insurance and Financial Advisors, Missoula, 5/2014.

"Your Voice, Your Vote: Debt-ceiling deadline." KATU News. October 2013.

"Jobs and Economy Forum." Oregon Summit. October 2013.

"Oregon's Economy: Mixed Symptoms" Testimony before Oregon House Committee on Transportation and Economic Development. February 2013.

"Polka Dots and Stripes: Mismatch Between Supply and Demand in a Changed Economy." Housing Land Advocates Conference. Portland, Oregon. September 14, 2012.

"Eugene-Springfield's economy" Eugene City Club. Eugene, OR. July 13, 2012.

"Economic Growth, Natural Capital, and Sustainability." CLE presentation. Portland, Oregon. April 11, 2012.

"Benefits and Costs of Seismic Mitigation." January 19, 2011. CREW Benefit-Cost Analysis Forum. Eugene, Oregon.

"Does Low-Impact Development Affect Property Values?: Evidence from Seattle's Natural Drainage System Projects." Water Environment Foundation Sustainability 2008 Conference. June 2008.

"Compensation for ROW Access Under the Telecommunications Act of 1996: Fiscal Issues Related to Communications Services." NATOA 27th Annual Conference.

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“Outside the Light: The real factors driving Eugene/Springfield's Economy.” Eugene-Springfield Leadership Program. Sponsored by the Eugene Area Chamber of Commerce. Eugene, Oregon. October 2006.

“Deregulating the Housing Market.” Preserving the American Dream Conference. Sponsored by the American Dream Coalition. Atlanta, Georgia. September 2006.

Teaching

Instructor, University of Montana; Course: Social Networks and Social Skills, Spring 2020.

Visiting Adjunct Instructor, Portland State University; Courses: Global Environmental Economics, Spring 2010.

Visiting Assistant Professor, Lewis and Clark College; Courses: Intermediate Microeconomic Theory, Econometrics, Public Economics, Environmental and Natural Resource Economics, Spring 2008 & Fall 2009.

Visiting Adjunct Instructor, University of Oregon; Courses: Labor Economics, Spring 2009.

Tutorial Leader, Harvard College; Courses: Everybody's Doin' It: Social Interactions and Economics, 2002-2006, Senior Thesis Tutorial: Labor, 2004-05.

Teaching Fellow, Harvard University; Courses: Intermediate Microeconomic Theory, Intermediate Macroeconomic Theory, Microeconomics: A Policy Tool for Educators, 2001-2003.

Teaching Assistant, University of Oregon; Courses: Principals of Microeconomics, Urban Economics, Economy of the Pacific Northwest, 1998-1999.

Memberships

- Maureen and Mike Mansfield Center, Advisory Board, 2021-Present.
- Mountain-Pacific Quality Health Foundation, Board of Directors, 2014-2020
- Oregon Seismic Safety Policy Advisory Commission (OSSPAC), 2012-2013.

Appendix B**Materials Considered****Tucson Documents**

Bates
FY2017 Social Media Litigation Positions 04.27.25 TUSD
FY2018 Social Media Litigation Positions 04.27.25 TUSD
FY2019 Social Media Litigation Positions 04.27.25 TUSD
FY2020 Social Media Litigation Positions 04.27.25 TUSD
FY2021 Social Media Litigation Positions 04.27.25 TUSD
FY2022 Social Media Litigation Positions 04.27.25 TUSD
FY2023 Social Media Litigation Positions 04.27.25 TUSD
FY2024 Social Media Litigation Positions 04.27.25 TUSD
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Professional Non-Teaching Salary 24-25.pdf
FY2024 Social Media Litigation Positions 04.27.25 TUSD
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2023-07-11 2024EXPBUD Adopted signed(1).pdf.]

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Litigation Documents

Master Complaint (Redacted) (Local Government and School District), March 27, 2024 In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation (MDL 3047)
Defendants' Motion to Dismiss the School District and Local Government Entities' Master Complaint, February 5, 2024 In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation (MDL 3047)

Plaintiffs' Opposition to Defendants' Motion to Dismiss the School District and Local Government Entities' Master Complaint, March 4, 2024 In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation (MDL 3047)
Defendants' Reply ISO Motion to Dismiss the School District and Local Government Entities' Master Complaint, March 25, 2024 In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation (MDL 3047)
Order Granting in Part and Denying in Part Defendants Motion to Dismiss the School District and Local Government Master Complaint, October 24, 2024 In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation (MDL 3047)
Order Granting in Part and Denying in Part Defendants Motion to Dismiss the School District and Local Government Entities' Claims of Public Nuisance, November 15, 2024 In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation (MDL 3047)
2024-06-01 Tucson Supplemental Plaintiff Fact Sheet
2024-06-28 Tucson Second Amended Plaintiff Fact Sheet
2024-08-22 SD BW Pls.' Amended Rule 26 Initial Disclosures
2025-02-18 Tucson - SHAPE Profile
2025-05-12 Declaration of Brian Lambert
2025-05-13 Declaration of Julie Shivanonda
2025-05-13 Declaration of Holly Hammel
2025-05-13 Declaration of Dr. Sabrina Salmon
2025.05.18 Expert Report of Robert L. Klein - Tucson

Other Expert Documents

Final Data Analysis_5.12.25
